

### **REMARKS**

This Amendment A is responsive to the first Office Action on the merits mailed June 2, 2005. Applicants respectfully submit that claims 18, 20-27, 30-35, 40-42, and 50-55 as set forth herein patentably distinguish over the cited references and should be allowed. Additionally, Applicants respectfully submit that withdrawn species claims 19 and 36-39 should be reinstated and allowed upon allowance of the corresponding generic base claims.

### **Status of the Claims**

Claims 19 and 36-39 have been withdrawn responsive to a previous restriction requirement.

Claim 35 stands rejected under 35 U.S.C. § 102(e) as anticipated by Tysoe et al., U.S. Published Application 2004/0195598 (hereinafter "Tysoe").

Claims 18, 20-27, 30-34, 40-42, and 50-53 are indicated as allowable.

### **Information Disclosure Statements**

Applicants gratefully acknowledge the indication of receipt and consideration of Applicants' Information Disclosure Statement (IDS) filed with the application.

However, Applicants note that a Supplemental IDS filed by Applicants on Feb. 16, 2004, and indicated on the PAIR page as having an OIPE stamp of Feb. 19, 2004, is not acknowledged on the Office Action Summary Sheet and is not included with the Office Action. Applicants respectfully request an indication of receipt and consideration of this Supplemental IDS in the forthcoming Office communication.

In this regard, Applicants notice that the Supplemental IDS lists provisional application S/N 60/435,1899 – this should read S/N 60/435,189 (that is, there is an inadvertent doubling of the last digit "9" in the typed 1449 form).

### **Comment on the Allowable Claims**

Applicants gratefully acknowledge the indicated allowance of claims 18, 20-27, 30-34, 40-42, and 50-53. However, while Applicants agree that the claims should be allowed, Applicants do not concede that the claims are only allowable for the precise reasons stated in the Office Action.

### The Tysoe reference

Tysoe has been applied as a reference under 35 U.S.C. § 102(e). Applicants note that Tysoe was filed on December 29, 2003 and is a continuation-in-part of parent application serial no. 09/694,690. Because the Dec. 29, 2003 filing date of Tysoe is after the Oct. 24, 2003 filing date of the present application, any content of the continuation-in-part that is not supported by the parent application is not prior art against the present application under 35 U.S.C. § 102(e).

The parent application S/N 09/694,690 was listed on sheet 2 of Applicants' IDS, and is marked as considered by the Examiner in the Office Action.

Elements 106, 112, and 120 of Tysoe cited in the Office Action against claim 35 identify components of FIGURE 4 of Tysoe. FIGURE 4 and the corresponding textual description is not in the parent application of Tysoe – it is newly added matter that is not supported by the parent application S/N 09/694,690, and hence does not qualify as prior art against the present application under 35 U.S.C. § 102(e).

The parent application S/N 09/694,690 illustrates two embodiments. FIGURE 1 shows a light emitting diode which does not include a resonant cavity. FIGURE 2 shows a laser diode which does include a resonant cavity; however, the laser diode of S/N 09/694,690 is an edge emitter, not a vertical cavity surface emitter. This is shown by the fact that reflective edges of the device are formed by cleaving and optional polishing. See S/N 09/694,690 at least at p. 15 line 22-p. 16 line 9. The resonant cavity of the edge emitting laser diode of FIGURE 2 is defined by the cleaved reflective sides; it is not defined by top and bottom distributed Bragg reflectors. Nowhere in S/N 09/694,690 is a distributed Bragg reflector mentioned.

Finally, it is noted that the present Application and Tysoe are both assigned to General Electric Company. In accordance with 35 U.S.C. § 103(c), Tysoe does not qualify as prior art under 35 U.S.C. § 103(a).

**Amended claim 35 distinguishes over the cited references**

Claim 35 has been amended to specify that at least one of the first and second mirrors include a distributed Bragg reflector. The amendment is supported in the original specification at least by elected FIGURE 7 and corresponding text at ¶[0094].

The Tysoe parent application S/N 09/694,690 does not disclose a distributed Bragg reflector. The resonant cavity in the edge-emitting laser diode of the Tysoe parent application is defined by cleaved edges of the die. Tysoe FIGURE 4 shows distributed Bragg reflectors; however, this is added matter that does not qualify as prior art against the present application under 35 U.S.C. § 102(e).

Accordingly, Applicants respectfully request that claim 35 be allowed.

Additionally, upon allowance of independent claim 35, Applicants respectfully request reinstatement and allowance of unelected species claims 36-39.

**New claim 54 distinguishes over the cited references**

New claim 54 includes the elements of original claim 35, but specifies a lower dislocation density for the single-crystal gallium nitride substrate, namely a dislocation density less than  $100 \text{ cm}^{-2}$ . This subject matter is supported in connection with elected FIGURE 7 in the original specification at least at ¶[0093], and is also called out in conjunction with other elements in claim 42.

Neither Tysoe nor its parent application S/N 09/694,690 disclose a dislocation density less than  $100 \text{ cm}^{-2}$  (*see, e.g.*, Tysoe ¶¶[0027], [0039]; S/N 09/694,690 at page 5 lines 11-14, page 10 lines 8-12). Accordingly, Applicants respectfully request that claim 54 be allowed.

**New claim 55 distinguishes over the cited references**

New claim 55 includes the elements of original claim 35 with the additional elements of first and second mirrors arranged parallel with the active region defining a vertical resonant cavity inside of which the active region is disposed.

The claim element specifying the first and second mirrors are arranged parallel with the active region is supported at least by FIGURE 7, which shows DBR mirrors 116, 126 arranged parallel with active region 120. The claim element specifying a vertical resonant cavity is supported at least at ¶[0028] and by FIGURE 7 (where the DBRs 116, 126 define a vertical resonant cavity).

The Tysoe parent application does not disclose a resonant cavity light emitting device having first and second mirrors arranged parallel with the active region defining a vertical resonant cavity inside of which the active region is disposed. The resonant cavity in the edge-emitter of the Tysoe parent application is defined by cleaved (and optionally polished) edges of the die, and hence is horizontal as befits an edge-emitting laser. The cleaved sides are perpendicular to, not parallel with, the active region. The Bragg reflectors of Tysoe FIGURE 4 are added CIP matter that does not qualify as prior art against the present application under 35 U.S.C. § 102(e). Accordingly, Applicants respectfully request that claim 55 be allowed.

**Applicants ask for reinstatement and allowance of Claim 19 which depends from allowed independent claim 18**

As noted in the Restriction Requirement mailed Feb. 10, 2005, at page 3: "[u]pon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR [§] 1.141."

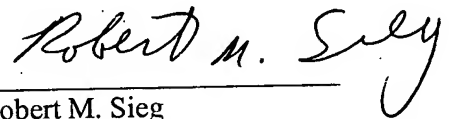
Accordingly, as claim 18 has been allowed, Applicants respectfully request reinstatement and allowance of unelected species claim 19.

CONCLUSION

Based on the foregoing, it is submitted that claims 18, 20-27, 30-35, 40-42, and 50-55 as set forth herein are fully in condition for allowance. Additionally, it is respectfully submitted that unelected species claims 19 and 36-39 should be reinstated and allowed upon allowance of corresponding base claims. Accordingly, Applicants ask for allowance of claims 18-27, 30-42, and 50-55 as set forth herein.

Respectfully submitted,

FAY, SHARPE, FAGAN,  
MINNICH & McKEE, LLP



Robert M. Sieg  
Reg. No. 54,446  
1100 Superior Avenue, 7<sup>th</sup> Floor  
Cleveland, OH 44114-2579  
Phone: (216) 363-9156  
Fax: (216) 241-1666